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THE INSTINCTS OF BIRDS.

TO THE EDITOR OF SCIENCE: So much interest is now taken in psychology that, although it is not the field of science with which I am most familiar, I believe that the statement of an observation I made this summer may be of interest.

My hired man brought home a nest of young hawks, probably a week old. We tried to rear them on meat. After a few days I noticed in some way that they tried to peck at a *red* rag. It occurred to me to try if the color had any influence. I found that, while they would sometimes peck at any rag, they would always attack a red one. It would seem, therefore, that they noticed the red of the meat.

We also found that they were cannibals, for, not being fed quite enough meat one day, they attacked the weakest one, and would have killed it; in fact, it did die in a day or two.

GEO. CHAS. BUCHANAN.

HENNING, MINN.

FINAL SUMMARY REPORT OF THE GEOLOGICAL SURVEY OF PENNSYLVANIA.

TO THE EDITOR OF SCIENCE: In your issue of June 12, 1896, there appeared over the signature of Dr. J. J. Stevenson a brief review and criticism of the Final Summary Report of the Geological Survey of Pennsylvania, in which Dr. Stevenson was good enough to commend, in general, the results attained under such adverse circumstances as the general public could hardly be expected to realize.

It was several weeks after this article was written that my attention was called to it, and in writing to the author of it, to thank him for his very generous praise, I expressed chagrin and regret that he should have taken apparent exception to the *manner* and *place* in which credit was given to the various assistants whose work and reports formed so large a part of, and the basis for, Volume III., in the compilation of which I was so largely responsible.

In his reply, as well as in the original article, Dr. Stevenson was courteous enough to realize the absence of any intention to detract from the very high merit due him and others for the painstaking work they performed in elucidating

the geology of the State, but very properly pointed out that the casual reader of the Final Summary, from the character and number of references to his name in connection with the chapters on the bituminous coal measures in southwest Pennsylvania, might readily fail to give credit to him for his labors in that district.

After carefully reviewing the chapters referred to, pp. 2448 to 2564 in Vol. III., Part 2, I cordially endorse Dr. Stevenson's criticism, and ask the medium of your widely read journal, not only to express my sincere regret for that deficiency in the Summary, but to accord to Dr. Stevenson the fullest possible credit for his exceptionally excellent work in the coal district.

To all who have had access to the reports of the Geological Survey this tribute is hardly necessary; for the several volumes* which bear his name attest the fidelity and general value of his work as well as the high scientific character of his investigations; but to such as have not become familiar with these individual volumes it gives me only pleasure to say, that not only were his several reports (in common with those of many other assistants) freely used by me in my compilation of the survey in the Bituminous Region, but his sections, plates and measurements of coal beds as well, and I regard them as amongst the most valuable and reliable data secured during the progress of the survey.

This was the object of the 'Summary Report,' and if space and means had permitted it, every assistant's name should have been attached to his particular work, in the body of the report as well as in my prefatory letter (see Volume III., Part I., pp. 1855 and 1856), where a general acknowledgment was made of the work of all the aids.

To Dr. Stevenson, as well as to the Messrs. Platt, White, Ashburner, Chance and Sherwood, is Pennsylvania indebted for a wealth of facts concerning the geology of the Appalachian coal field. To them all, and individually, are due my heartiest acknowledgments in the preparation of the 'Summary Report,' and above all, to the venerable Director of the Survey, Dr. J. P. Lesley, whose notes, illustrations and valuable prefatory notices, were all freely

* Reports K, K₂, K₃ and T₂.

accorded and made use of by me for the benefit of the object in view.

E. V. D'INVILLIERS.

PHILADELPHIA, PA.

SCIENTIFIC LITERATURE.

General Principles of Zoology. By RICHARD HERTWIG. Translated by GEORGE W. FIELD.

Henry Holt & Company, New York. 1896.

The most pressing need for teaching elementary zoology in American schools is a suitable text-book; one that treats the general principles in a way that clothes with flesh the skeleton of systematic zoology; one written with genius that holds the attention and inspires. It must be clear and compact. Prof. Hertwig's 'Lehrbuch der Zoologie' is such a book, and an English edition will doubtless give an impulse towards better teaching and better discipline in acquiring the foundations of animal biology. The separation of the 'General Principles' from the 'Systematic Part' as an independent volume may be regarded as an advantage, since its clear, comprehensive, though brief, generalizations and discussions make it a useful hand-book for teachers, students and general readers who want to find and understand the latest position of the science.

In the introduction the author defines the purpose of zoological study, morphology, comparative anatomy, ontogeny, etc. The body of the book proceeds under two general heads—'The History of Zoology' and 'General Morphology and Physiology.' The former covers sixty-seven pages in which are presented with surprising satisfaction and impartiality the positions of the creators of the science from the systematists and anatomists of classic antiquity to the investigators and teachers of to-day. Two-thirds of this space is justly given to the theory of descent, its history and proofs. Lamarckianism and Darwinism are succinctly interpreted and the additions and modifications suggested by advocates and opponents stated. In the general morphological part after certain definitions are given comes the history of the cell and the general principles of cytology; the latter and the chapter on general embryology are perhaps the most helpful in the book and leave little to be desired in a summary of these sub-

jects. If one wants to know the position of zoologists on mimicry, distribution, promorphology, or the nature of species, this modest manual will afford him a reliable exposition.

The translator certainly deserves much credit for his part, scarcely an involved or muddled sentence occurs. The illustrations are familiar but well selected.

One so disposed might make a case in apparent criticism, for example, the young sponge figured on page 159, named '*Spongilla fluviatilis* (after Huxley),' some would prefer to see as *Meyenia fluviatilis* (after Lieberkühn); again on page 199: "Many *Protozoa* fuse with one another and form large bodies in which the individual animals can still be recognized." This seems to imply more than some feel like granting. *Ophrydium versatile* and *Proterospongia haeckeli*, for example, occur in large masses with hundreds of individuals imbedded in the support of cast-off or accumulated matter for protection; it seems to mean no more than the compound pedicels of other forms, or a chain of the loricae of *Cothurnia variabilis*. But such differences may not be criticisms and certainly do not detract from the usefulness of the book.

Surely all who read this treatise will earnestly hope that the systematic part of the 'Lehrbuch' may speedily follow in the same admirable style.

D. S. KELLICOTT.

OHIO STATE UNIVERSITY.

Lehrbuch der vergleichenden mikroskopischen Anatomie der Wirbelthiere. DR. MED. ALBERT OPPEL. Erster Theil; Der Magen. Jena, Gustav Fischer. 1896.

Since Leydig's 'Histologie' appeared forty years ago there has been no systematic attempt at a summary of our histological knowledge. The works on histology have confined themselves chiefly to the histology of man and the higher animals, except in cases where a lower form happened to be especially favorable for purposes of illustration. The study of histology has been so closely connected with that of medicine that this is not to be wondered at; but now, when the value of comparative study is so obvious, and when the lower animals are being studied from a purely scientific point of view, an attempt to collate and arrange the